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XVI.—*On the Gold-fields of Uruguay, South America.*

By H. BANKART.

My attention having been drawn, in the middle of the year 1867, to some remarks made by the Jesuits in their writings upon South America, in which they reported the existence of gold, south of Brazil, in the territory now known as the Banda Oriental, I determined to judge for myself and carefully examine the northern portion of the Republic. Starting from the highest revenue port (Salto) on the Uruguay, I took a nearly due east course, passing through the department of the same name for about 160 miles, without obtaining traces of anything but copper, lead, and iron. Portions of the district abound in magnificent agates and amethysts, with compact crystalline limestone, slate, and amygdaloidal rocks, intersected by petrified trees and animal fossils to a large extent. From thence I pursued my investigations in the neighbouring department of Tacuarembó, between the 30th and 33rd parallels of latitude, and 54th to 56th degrees of longitude, where I met with a complete change. Granitic and quartzose rocks of the primary formation, intersected by slate-reefs in immense ranges, met the eye on all sides, running into Brazil; most of them bearing in a northerly direction, and dipping to the east. In this, as in the adjoining state, wood of a stunted growth is only to be met with on the banks of the rivers. On examining the sands and detritus at the bottom of the rivers Tacuarembó Grande and Chico, I found a little very fine gold; and proceeding farther on the other side, I came upon some alluvial deposits washed down from the surrounding hills, consisting of gravel, rounded quartz boulders, decomposed slate, sometimes 30 feet deep, resting upon syenitic granite; this would, in many places, yield well with proper appliances. And at a place called Corrales, originally (from appearances) a lake, having all around limestone, auriferous quartz, and slate-reefs, I learnt that small petitas or pieces of the precious metal are constantly met with clinging to the roots of the palm-grass used for thatching purposes: no trial has as yet been made as to the probable deposit of gold below, for it is always a swamp. I learnt that some years ago a Brazilian, with the aid of his slave, had washed out over 50 pounds' weight of free gold, after three months' labour from a dry creek not very far from this.

I immediately proceeded to the spot indicated, and there saw the remains of their workings through the drift. On searching the neighbouring hills, I found several fine quartz-lodes

bearing N.N.W. and dipping eastwards. I met with free gold here and there plainly visible to the naked eye, from which I took many samples, also occasionally auriferous pyrites below the surface; these lodes vary from 3 feet to 15 in width. A piece of solid gold weighing over 1 lb. (of 16 ounces) has been taken out of the quartz on the surface, and is in the hands of the Uruguayan minister of war.

Here I entered an open cutting about 6 feet deep, and descended into a shallow well cut into the quartz, and was able to pick down rock which contained gold of a superior quality. Between these gullies and the quartzose hills lay several flats, composed to some depth of gravel, rounded quartz and slate. Evidently having a probability of proving richer in metal than the adjoining creeks, which appear to be of more recent formation; but in all the gravel of the deep ravine which had been torn open by floods, I noticed an entire absence of small pieces of quartz such as are found covering the slopes of the mountains or in the lower deposits of gravel: these quartz-lodes are generally traversed by slate-reefs, and sometimes run into or cease when brought into contact with granite. To my surprise, I noticed here and there shepherds, even in these remote parts (who had never heard of other gold-fields), squatting on the ground, engaged in turning up the surface for about 15 inches, and breaking up the pieces of quartz with a hammer upon a stone mortar, setting aside such as contained visible gold, and rejecting the rest. By thus working for a few hours they managed to collect a small heap of specimens, which they carried home, and, after accumulating day by day a sufficient quantity, they calcined and pounded them in a *batea* with mercury. By this operation they obtained only the heavier gold, throwing away the rest as useless; the result gave them on an average, as far as I could judge, half an ounce per working day. The gold thus extracted finds its way sometimes into Montevideo, but more generally to the Rio Grande, where it is no uncommon thing to meet with purchasers of one to two hundred ounces at a time. The gold is of four qualities, ranging from 15 to 23 carats. The ground here answers to the surface-diggings of Australia and the placers of California, only the order of things is slightly reversed. In those countries the gravel was invariably washed to obtain the free gold, the quartz being thrown away; whilst in the Uruguay the quartz is alone crushed, and the gravel disregarded. No doubt some of the richest deposits lay in these accumulations, for wherever I washed this drift I invariably found gold, though in company with a large proportion of magnetic iron, which renders the separation of the gold very difficult. My investigations led me to enquire if there had

been no excavations made in the quartz-reefs; and, in reply, I was shown various spots where shafts had been commenced but relinquished after going two or three fathoms deep, on account of water; which they greatly lamented, as in all cases the rock had proved extremely rich, but they had no appliances whereby they could get rid of this water. I devoted some weeks in testing the accuracy of their statements, and I was enabled to return with a plentiful supply of very good stone. I pursued my researches for about 90 miles in length on the course of the lodes, and stretching 18 miles across them. Several lofty hills of magnetic iron were encountered bounded by trap, and running into slate. And both in the gossau and in the gravel at their base, I washed more or less gold in every pan. In this department there are two extinct craters, one having been in active operation within the memory of several residents there. After satisfying myself that this country promised great results from the beneficial employment of capital, I returned to Montevideo, and communicated with the President of the Republic—laying before him the result of my labours. Up to this period the idea that gold to any extent existed in this province was ridiculed; but he at once promised his co-operation in the formation of a company, believing rightly that payable gold-fields offered peculiar attraction for increased immigration. Unfortunately his assassination followed shortly after, which deterred the realization of our hopes, until the present administration took office, who not only carried out all that General Flores had promised, but were prepared to go further (if called upon to do so). The company was speedily formed, and I was deputed to England to select and purchase the necessary build-ings and machinery of the most recent and approved principle for carrying out their views.

The various assays made in England of the specimens I brought over gave the following results:—

No.					ounces.	dwt.	grains.
1	Gold	..	..	..	87	16	16
2	Fine Gold	..	..	..	76	0	0
3	{ Fine Gold	..	..	..	81	16	14
	{ Fine Silver	..	..	..	18	8	14
4	Fine Gold	..	..	..	2992	11	0
5	Fine Gold	..	..	..	6512	18	0

But it must not be for one moment supposed that because these samples have proved so rich, that therefore the whole of the lodes will be equally good; far from it. But I am of opinion that, with effective machinery and economical working, there presents in the surface and shallow sinkings, if not in the quartz-lodes, a very fair and remunerative field both for capitalists and

labourers. I think from the reefs we may fairly average the produce at 2 ounces, if not more, to the ton, and that is far higher than the general result on other gold-fields; and I may say that the prospects, so far as I have tried, are considerably better than any I have seen (in an experience of over 17 years) amongst the principal gold-fields of the world. The climate is extremely salubrious, and the new mining law recently passed is nearly all that can be desired. Every article of foreign production necessary for or connected with mining operations is permitted to enter the country free of duty, and mines are excepted from all taxes for 20 years. A royalty of 5 per cent. is claimed by the Government on all gold or other minerals exported. Any person so disposed may enter upon any portion of the Republic they like, and search for minerals or gold, being required only to give a fair compensation to the owner of the land for any damage actually sustained by the miners' work. Whilst staying in the capital, I was sent upon two exploring expeditions after coal; but though the formations of the country around appear to be against such a probability, I discovered good graphite and jet, also hematite iron-ore to the westward of Montevideo, and to the east fine-grained marbles, white, flesh-coloured, and green; and rock rich in galena! Also large and strong lodes of pyrites and sulphide of copper associated with gold, evidently from the quartz and slate reefs that traverse them. These metalliferous lodes extend for many miles, giving unmistakeable evidences at the surface of the riches hidden below. Here ancient workings have been abandoned evidently from excess of water, which is abundant, and from paucity of capital. These are situated only about 90 miles from the seaport of Maldonado, and would, I feel sure, yield large results if properly and vigorously prosecuted.

XVII.—*Notes on the Map of the Peninsula of Sinai.** By the Rev. F. W. HOLLAND.

THE Map of the Peninsula of Sinai does not profess to be more than a sketch-map, illustrating the general features of the southern portion of that interesting country. In the winter of 1867-8, it was my intention to have spent some months in thoroughly exploring and mapping that portion of the Peninsula which lies between Suez and Jebel Musa, west and south of the mountain ranges of Jebel er Rahah, and Jebel et Tih, and for this purpose I received a grant of instruments from the Royal

* In illustration of Mr. Holland's Memoir in the 'Journal,' vol. xxxviii., p. 237.